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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,421	02/24/2004	Apparao M. Rao	CXU-404	8574
22827	7590	04/05/2005	EXAMINER	
DORITY & MANNING, P.A. POST OFFICE BOX 1449 GREENVILLE, SC 29602-1449			BELLAMY, TAMIKO D	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/785,421	Applicant(s) RAO ET AL.	
	Examiner Tamiko D. Bellamy	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/7/05</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I, claims 1-10 in the reply filed on 2/7/05 is acknowledged. Claims 11-43 have been canceled.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimes (6,359,444) in view of Groger et al. (5,514,337).

Re to claims 1 and 6, Grimes discloses in fig. 2E a resonator (e.g. resonator circuit 104) including a layer of absorptive nanostructures (e.g., **substrate based** structure element (106) such as carbon nano-tubes) (Col. 15, lines 25-40). As depicted in fig. 2E, Grimes discloses that the resonator is in electrical communication with the layer. While, Grimes does not specifically disclose that the resonator comprises a dielectric material in electrical communication with the layer such that the effective resonant frequency of the resonator depends upon the dielectric constant of the dielectric material and the dielectric constant of the layer comprising the adsorptive nanostructures, it is well known in the art to use a dielectric substrate with a resonator. Re to the further limitation of claim 6, Grimes does not specifically disclose a micro-strip circuit

Art Unit: 2856

board resonator. Groger et al. discloses in fig. 5 a resonator (e.g., micro-strip resonator (31)) having a dielectric material (e.g., circuit board dielectric substrate 11) (Col.6, lines45-58). Therefore, to modify Grimes by employing a dielectric material and a micro-strip circuit board resonator would have been obvious to one of ordinary skill in the art at the time of the invention since Groger et al. teaches a chemical sensor having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Grimes and Groger et al. since Grimes states that his invention is applicable to a resonant circuit used for a gas and Groger et al. is directed to resonant circuit used for sensing a chemical/gas.

Re to claim 2, Grimes discloses an analyzer for obtaining the resonant frequency.

Re to claim 3, While Grimes uses an analyzer that is in remote access communication with the analyzer, to use a hard-wire communication is a design consideration clearly in the preview of one having ordinary skill in the art. Therefore, to employ Grimes on an analyzer with hard-wire communication with a resonator would have been obvious to one of ordinary skill in the art at the time of the invention since this reference explicitly teaches its use on a resonant circuit used for detecting a gas including an analyzer.

Re to claims 4 and 5, Grimes discloses an analyzer in remote access communication with the resonator.

Re to claims 7-9, Grimes discloses an absorptive nanostructures (e.g., **substrate based** structure element (106) such as carbon nano-tubes) (Col. 15, lines

Art Unit: 2856

25-40). As depicted in fig. 2E Grimes discloses carbon nano-tubes, which includes degassed carbon nanotubes, single-walled nanotubes, or multi-walled tubes.

Re to claim 10, Grimes discloses an absorptive nanostructures (e.g., **substrate based** structure element (106) such as carbon nano-tubes) (Col. 15, lines 25-40).

While, Grimes does not specifically discloses that the layer comprising absorptive nanostructures is about 2 $\mu$ m in depth, as depicted in figs., 2A-2G, Grimes discloses a layer of absorptive nanostructures having various depths. Furthermore, the court held in, In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955), the change is size of a prior art is a design consideration clearly in the preview of one having ordinary skill in the art. Therefore, to employ Grimes on an layer comprising absorptive nanostructures is about 2 $\mu$ m in depth would have been obvious to one of ordinary skill in the art at the time of the invention since this reference explicitly teaches its use on a resonant circuit used for detecting a gas including an analyzer.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (571) 272-2190. The examiner can normally be reached on Monday - Friday 7:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Art Unit: 2856

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tamiko Bellamy

T.B.

April 2, 2005

  
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